

EPCOT FRANCE BACK OF HOUSE MODIFICATIONS  
STORMWATER CALCULATIONS  
FOR  
SOUTH FLORIDA WATER MANAGEMENT DISTRICT  
AND  
REEDY CREEK IMPROVEMENT DISTRICT

MAY 25, 2017  
REVISED MAY 26, 2017  
REVISED JUNE 6, 2017  
REVISED JUNE 20, 2017

## **1.0 Overview:**

This project proposes to modify SFWMD permit 48-00714-P. The project area is 5.70 acres in Epcot and consists of adding impervious surface. Stormwater from the site discharges through existing conveyance pipe to the RCID Epcot Master Drainage System.

### **Application Type**

Modification of SFWMD permit 48-00714-P.

Permit type: General permit modification

### **Location**

Orange County

Section 30, Township 24S, Range 28E

Owner and Permittee: Walt Disney Parks and Resorts US, Inc., P.O. Box 10000, Lake Buena Vista, FL, 32830, Attn. Ms. Joyce M. Bowers

Operating Entity: Walt Disney Parks and Resorts US, Inc., P.O. Box 10000, Lake Buena Vista, FL, 32830, Attn. Ms. Joyce M. Bowers

Project Area: 5.70 acres

Project Land Use: Entertainment

Drainage Basin: Reedy Creek

Receiving Water Body: Reedy Creek via existing master system

Total Acres of Wetlands Onsite: None

Total Acres of Wetland Impacts: None

Total Acres Preserved Wetlands: None

Floodplain Impacts: None

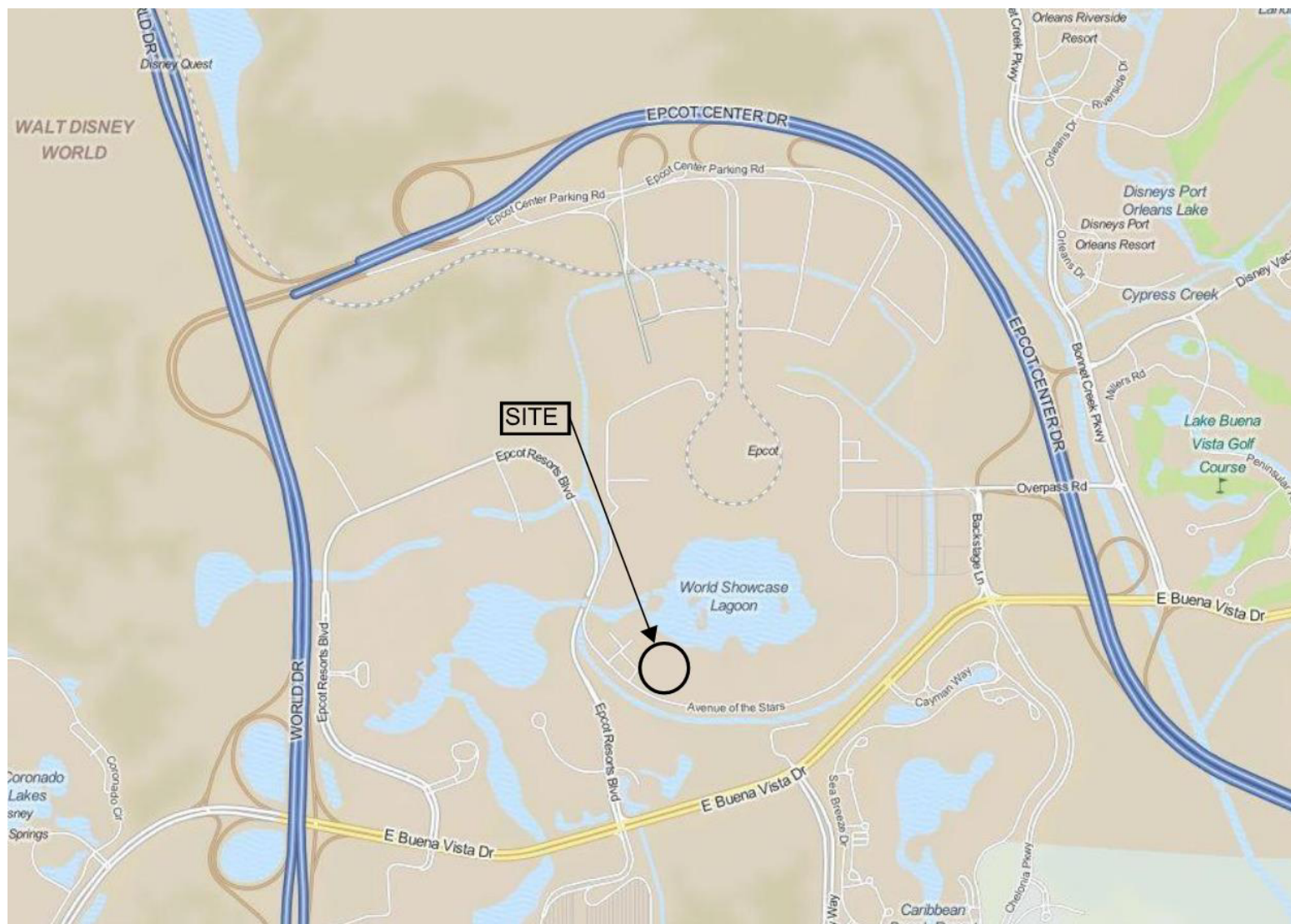
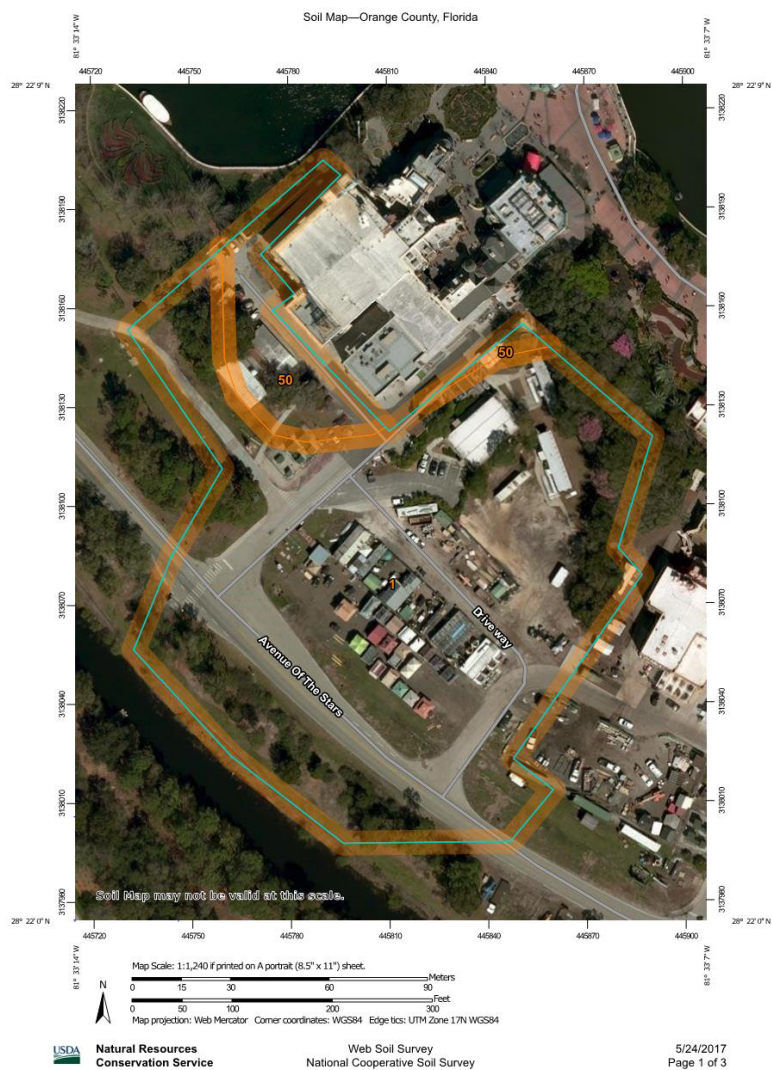


Figure 1: Location Map – Walt Disney World, EPCOT, Section 30, Township 24S, Range 28E



Figure 2: Aerial Photograph – Walt Disney World, EPCOT



## Map Unit Legend

Orange County, Florida (FL095)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Arents, nearly level	4.2	89.9%
50	Urban land	0.5	10.1%
<b>Totals for Area of Interest</b>		<b>4.6</b>	<b>100.0%</b>

Figure 3: Soils Map – WDW EPCOT



Project  
outflow  
location  
to  
L-403  
Canal

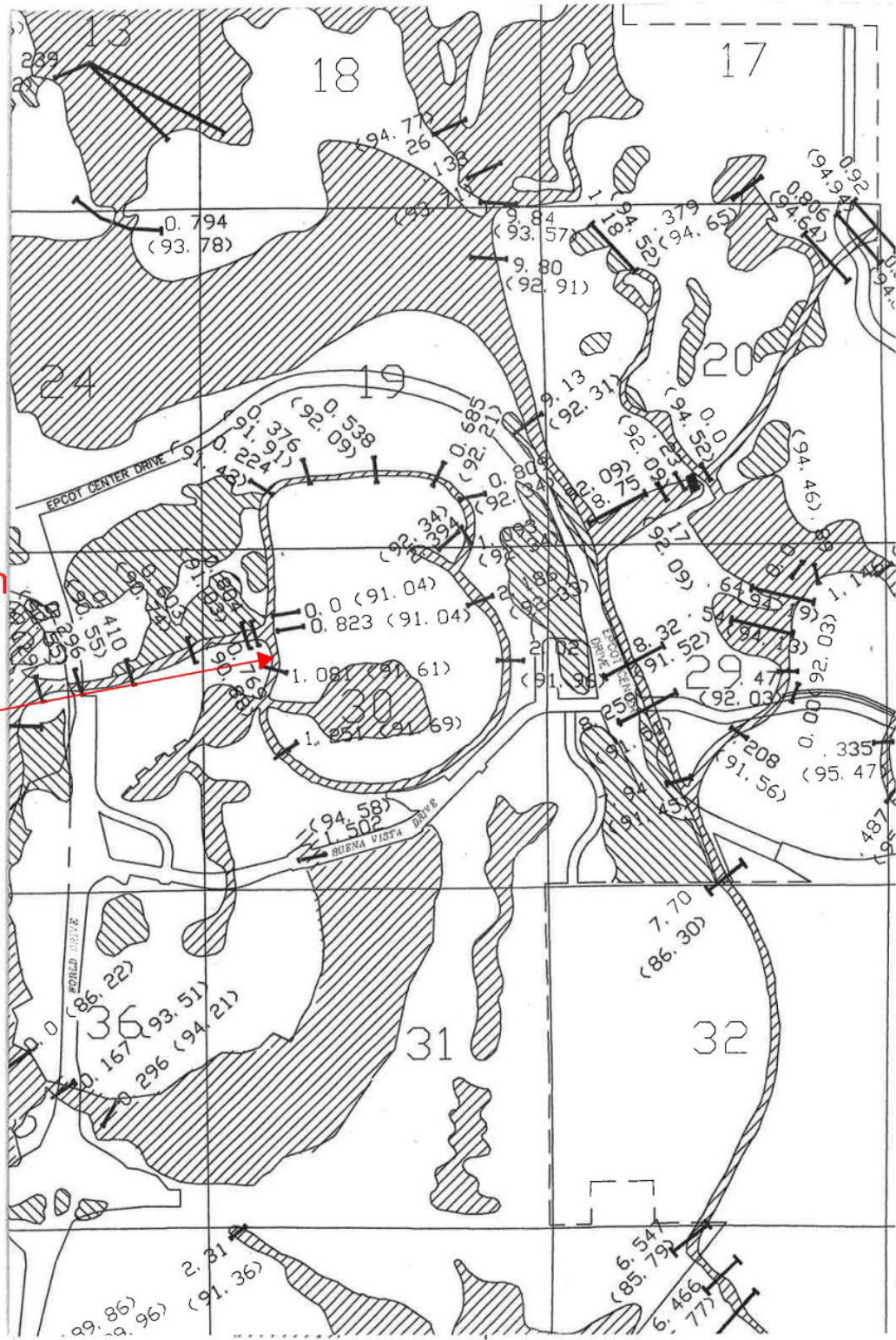


Figure 5. RCID Drainage Basin Map. Canal cross-section identification.

Table 13  
2009 Water Surface Data

Canal Name	Reach Number	Cross Section Number	Section Number	2009 100-Year Flood Maximum Elevation	2009 10-Year Flood Maximum Elevation
Epcot Canal South	27	209	2.120	92.17	91.41
		210	2.100	92.16	91.40
		211	2.090	91.97	91.26
		212	2.060	91.98	91.27
		213	2.040	91.98	91.27
		214	2.020	91.96	91.26
		215	2.010	91.74	91.11
		216	1.990	91.75	91.11
		217	1.990	91.74	91.11
		218	1.250	91.69	91.08
		219	1.180	91.69	91.08
		220	1.160	91.69	91.07
		221	1.110	91.67	91.07
		222	1.100	91.67	91.07
		223	1.080	91.61	91.04
		224	1.060	91.02	90.64
		225	1.050	91.06	90.66
		226	1.030	91.07	90.67
		227	0.980	91.08	90.67
		228	0.890	91.07	90.67
		229	0.820	91.04	90.65
L-403	28	230	0.830	91.04	90.65
		231	0.810	91.03	90.65
		232	0.800	91.03	90.64
		233	0.800	91.03	90.64
		234	0.790	91.03	90.64
		235	0.790	91.01	90.63
		236	0.770	90.88	90.54
		237	0.760	90.90	90.55
		238	0.740	90.89	90.55
		239	0.720	90.89	90.55
		240	0.710	90.87	90.54
		241	0.640	90.84	90.52
		242	0.620	90.83	90.52
		243	0.610	90.83	90.51
		244	0.610	90.85	90.52
		245	0.610	90.84	90.52
		246	0.600	90.74	90.47
		247	0.530	90.46	90.28
		248	0.510	90.57	90.33
		249	0.460	90.56	90.33
		250	0.440	90.56	90.33

Water surface elevation at discharge location to L-403 canal



Figure 6. RCID Drainage Basin Map. Canal water surface elevations.

## **2.0 Project Site Description**

The 5.70 acre project in Epcot consists of adding impervious surface. Stormwater from the site discharges through existing conveyance pipe to the RCID Epcot Master Drainage System.

## **3.0 Proposed Project**

This project proposes additional impervious surface. Stormwater treatment will be provided by the construction of two new dry detention ponds that outlet to the RCID EPCOT Master Drainage System. There are no wetland or floodplain impacts associated with this work.

## **4.0 Existing Conditions Land Use**

Refer to the Pre-Development Drainage Basin Maps, drawings C-250 and C-251 in Appendix 2 for a description of the existing conditions drainage basins.

**Table 1:** Existing Conditions Summary

	<b>Existing Conditions</b>
<b>Total Area</b>	<b>5.70 ac</b>
<b>Pervious area</b>	<b>4.29 ac</b>
<b>Impervious area</b>	<b>1.41 ac</b>
<b>Pond area</b>	<b>0.00 ac</b>
<b>CN</b>	<b>84.5</b>

$$CN_{\text{impervious}} = 98$$

$$CN_{\text{pervious}} = 80 \text{ (from RCID Master Drainage Plan Update for Basin L403-14)}$$

$$\text{Composite CN} = 84.5$$

### **Geotechnical Investigation**

Refer to Appendix 3 for the Geotechnical Investigation completed by PSI and dated May 4, 2017. The proposed dry detention ponds will be located near geotechnical boring AB-1. The seasonal high groundwater table elevation documented in the geotechnical report is elevation 92.5 feet.

### **5.0 Proposed Conditions Land Use**

Refer to the Post-Development Drainage Basin Maps, drawings C-252 and C-253 in Appendix 2 for a description of the post-development drainage basins.

As shown on Table 2, part of the project area drains offsite and does not receive treatment. Most of this area is landscaped and cannot be discharged to the proposed stormwater system based upon elevations relative to the detention system. The proposed detention ponds are designed for the entire project limit of work including the areas that drain offsite and not to the new detention ponds.

**Table 2: Proposed Conditions Summary**

	<b>Drainage Basin to Dry Detention Ponds</b>	<b>Drainage Offsite without Treatment</b>	<b>Total Proposed Design Conditions for the Dry Detention Ponds (Entire Limit of Work)</b>
<b>Total Area</b>	<b>4.59 ac</b>	<b>1.11 ac</b>	<b>5.70 ac</b>
<b>Pervious area</b>	<b>0.29 ac</b>	<b>0.80 ac</b>	<b>1.09 ac</b>
<b>Paved (impervious) area including buildings</b>	<b>3.91 ac</b>	<b>0.31 ac</b>	<b>4.22 ac</b>
<b>Pond area</b>	<b>0.39 ac</b>	<b>0.00 ac</b>	<b>0.39 ac</b>

$CN_{\text{impervious}} = 98$

$CN_{\text{pervious}} = 80$  (from RCID Master Drainage Plan Update for Basin L403-14)

The following table describes the drainage area to each dry detention pond

**Table 3: Proposed Conditions to Dry Detention Ponds**

	<b>Drainage Basin to Detention Pond 1</b>	<b>Drainage Basin to Detention Pond 2</b>
<b>Total Area</b>	<b>4.05 ac</b>	<b>0.54 ac</b>
<b>Pervious area</b>	<b>0.20 ac</b>	<b>0.09 ac</b>
<b>Paved (impervious) area</b>	<b>3.56 ac</b>	<b>0.35 ac</b>
<b>Pond area</b>	<b>0.29 ac</b>	<b>0.10 ac</b>
<b>CN</b>	<b>97.1</b>	<b>95.0</b>

## **Water Quality Treatment Volume Calculations**

The following calculations summarize the water quality treatment volume provided in both dry detention ponds for the entire 5.70 acre limit of work.

Section 4.2 of SFWMD AH II: Wet Detention volume shall be provided for the first inch of runoff from the developed project, or the total runoff of 2.5 inches times the percentage of imperviousness, whichever is greater. Detention volume shall be provided equal to 75% of this amount.

### **Project Area Description**

Area = 5.70 ac

Pavement area = 4.04 ac

Roof area = 0.18 ac

Pond area = 0.39 ac

Pervious area = 1.09 ac

### **1" over area**

$$V = (1 \text{ ft}/12 \text{ in})(5.70 \text{ ac}) = 0.48 \text{ ac-ft}$$

### **2.5" multiplied by the percent impervious**

$$\text{Site area: total site} - (\text{roof} + \text{water body}) = 5.70 \text{ ac} - (0.39 \text{ ac} + 0.18 \text{ ac}) = 5.13 \text{ ac}$$

$$2.5'' \text{ multiplied by the percent impervious: } (2.5 \text{ inches})(4.04 \text{ ac}/5.13 \text{ ac}) = 1.97 \text{ inches to be treated}$$

Volume required for retention: inches to be treated x (total site – water body)

$$\text{Volume} = (1.97 \text{ inches})(1 \text{ ft}/12 \text{ inches})(5.31 \text{ ac}) = 0.87 \text{ ac-ft}$$

Treatment volume required is based upon 2.5" over % impervious area = 0.87 ac-ft

Provide dry detention which is 75% of this amount:  $0.75 * 0.87 \text{ ac-ft} = 0.65 \text{ ac-ft}$

**Table 3: Dry detention pond 1 stage-storage**

Stage	Area	Average Area	Incremental Volume	Cumulative Volume
93.5'	0.011 ac	0.049 ac	0	0
94'	0.087 ac	0.120 ac	0.025 ac-ft	0.025 ac-ft
94.5	0.153 ac	0.166 ac	0.060 ac-ft	0.085 ac-ft
95'	0.178 ac	0.204 ac	0.083 ac-ft	0.168 ac-ft
96'	0.229 ac	0.255 ac	0.204 ac-ft	0.372 ac-ft
97'	0.281 ac	0.308 ac	0.255 ac-ft	0.627 ac-ft
98'	0.335 ac	0.349	0.308 ac-ft	0.935 ac-ft
98.5'	0.362 ac		0.175 ac-ft	1.11 ac-ft

Control Structure #1: FDOT Type D Inlet

Grate (37" x 49") elevation 97.00'

3" diameter orifice, invert elevation = 93.50'

Outlet pipe: Invert = 92.00' (at control structure) with 30 LF 12" dia storm

Control Structure #2: FDOT Type D Inlet

Grate (37" x 49") elevation 97.00'

3" diameter orifice, invert elevation = 93.50'

Outlet pipe: Invert = 90.00' (at control structure) with 61 LF 12" dia storm

Treatment volume provided @ elev 97.00 feet = 0.627 ac-ft

**Table 3: Dry detention pond 2 stage-storage**

Stage	Area	Average Area	Incremental Volume	Cumulative Volume
93.5'	0.023 ac	0.042 ac	0	0
94'	0.060 ac	0.074 ac	0.021 ac-ft	0.021 ac-ft
95'	0.087 ac	0.102 ac	0.074 ac-ft	0.095 ac-ft
96'	0.116 ac	0.131 ac	0.102 ac-ft	0.197 ac-ft
97'	0.146 ac		0.131 ac-ft	0.328 ac-ft

Control Structure #3: FDOT Type C Inlet

Grate (24" x 37") elevation 95.50'

3" diameter orifice, invert elevation = 93.50'

Outlet pipe: Existing 30-inch diameter

Treatment volume provided @ elev 95.50 feet = 0.146 ac-ft

Total treatment volume provided = 0.627 ac-ft + 0.146 ac-ft = 0.773 ac-ft

**Treatment volume provided 0.77 ac-ft greater than the 0.65 ac-ft required**

#### **Drawdown Calculations:**

SFWMD requires that the maximum discharge is one half of the treatment volume in 24 hours. Both ponds have 3" diameter orifices at elevation 93.5 feet. A 3" diameter orifice is the smallest opening that can reasonably be assumed will operate without clogging.

Pond 1: One half of the treatment volume (0.314 ac-ft) corresponds to an elevation of 95.72'. According to the AdICPR results in Appendix 1, the water surface elevation draws down to elevation 95.72' 2 hours following the end of the design storm. This result is considered acceptable since the control structure utilizes the smallest size opening.

Pond 2: One half of the treatment volume (0.073 ac-ft) corresponds to an elevation of 94.70'. According to the AdICPR results in Appendix 1, the water surface elevation draws down to elevation 94.70' prior to the end of the design storm. This result is considered acceptable since the control structure utilizes the smallest size opening.

## **6.0 Surface Water Management Design Parameters – Computer Modeling**

Existing and proposed conditions are modeled with AdICPR version 3.10.

### **Precipitation**

10yr/72hr = 10.19 inches

100yr/72hr = 14.27 inches

### **Tailwater Conditions**

The two dry detention ponds discharge to RCID Canal L-403. The tailwater elevation at the outlet of the two ponds into the L-403 canal is elevation 91.07 feet for the 10-year design storm. This elevation is used in the ICPR model. Elevation 91.07 feet is taken from the RCID Master Drainage Plan Update as documented in Figures 4, 5 and 6 of this report.

### **Floodplain Elevation**

The floodplain elevation in the L-403 is elevation 91.69 feet as identified RCID Master Drainage Plan Update. This project does not impact the floodplain because all construction occurs above elevation 91.69 feet.

### **Summary of Results**

The results of the AdICPR routing are attached as Appendix 1 and summarized below.

Post-Development:

10yr/72hr Peak Discharge Rate = 15.45 cfs

100yr/72hr Peak Discharge Rate = 20.41 cfs

Dry Detention Pond 1:

10yr/72hr Peak Stage = 97.29'

100yr/72hr Peak Stage = 97.61'

Dry Detention Pond 2:

10yr/72hr Peak Stage = 95.59'

100yr/72hr Peak Stage = 95.66'

Stormwater attenuation is not required for this project because attenuation takes place in the EPCOT master drainage system that is controlled by RCID.

### Critical Data Summary Tables

#### **Land Use – Development Level Breakdown within Project Limit of Work**

<b>Basin ID</b>	<b>Building</b>	<b>Pavement</b>	<b>Water Mgnt</b>	<b>Pervious</b>	<b>Total</b>
<b>Existing</b>	0.31 ac	1.10 ac	0.00 ac	4.29 ac	5.70 ac
<b>Proposed</b>	0.18 ac	4.04 ac	0.39 ac	1.09 ac	5.70 ac

#### **Water Quality Discharge Table within Project Limit of Work**

<b>WQ Volume Required (af)</b>	<b>WQ Volume Provided (af)</b>	<b>Overflow Elevation (feet)</b>	<b>Allowable Discharge (cfs)</b>	<b>Proposed Discharge</b>	<b>Receiving Body</b>
0.65	0.77	97.00 (Pond #1)	NA	NA	Reedy Creek via the Existing Master Drainage System
		95.50 (Pond #2)	NA	NA	

#### **Design Storm Stages within Project Limit of Work**

<b>Basin ID</b>	<b>Control Elevation (feet)</b>	<b>10yr/72hr Stage (feet)</b>	<b>Proposed Min. Road Elevation (feet)</b>	<b>100yr/72hr Stage (feet)</b>	<b>Proposed Min FFE (feet)</b>
Dry Detention Pond #1	97.00'	97.29'	97.50'	97.61'	99.00'
Dry Detention Pond #2	95.50'	95.59'	97.50'	95.66'	99.00'

**Control Structures within Project Limit of Work – No change to permitted condition**

<b>Basin ID</b>	<b>Type</b>	<b>Low Water Control</b>	<b>Overflow Control (feet)</b>	<b>Receiving Body</b>
Dry Detention Pond #1	Two - 49" x 37" Inlet Grates	Two - 3" dia orifices, I.E. 93.50'	Weir elev = 97.00'	To Reedy Creek via the RCID Master Drainage System
Dry Detention Pond #2	37" x 24" Inlet Grate	3" dia orifice, I.E. 93.50'	Weir elev = 95.50'	To Reedy Creek via the RCID Master Drainage System

## **7.0 Water Use Sources – Potable, Wastewater, Dewatering, Irrigation**

Potable Water supplier: Reedy Creek Utilities

Waste water system: Reedy Creek Utilities

If dewatering is needed, the contractor will submit the application to RCID at the time of construction.

## **8.0 Water Resources**

There will be no impacts to the floodplain.

## **9.0 Wetland Impacts**

There are no wetlands within the limit of work or other wetland impacts for this project.

## **10.0 Mitigation**

Mitigation is not required.

## **11.0 Cumulative Impacts**

Not applicable.

## **12.0 Wetland Inventory**

There are no wetlands within the limit of work.

## **13.0 Threatened and Endangered Species**

The available information indicates that the project site does not contain preferred habitat for wetland-dependent endangered/threatened species or species of special concern.

## **14.0 Irrigation**

New irrigation will be provided to the site.

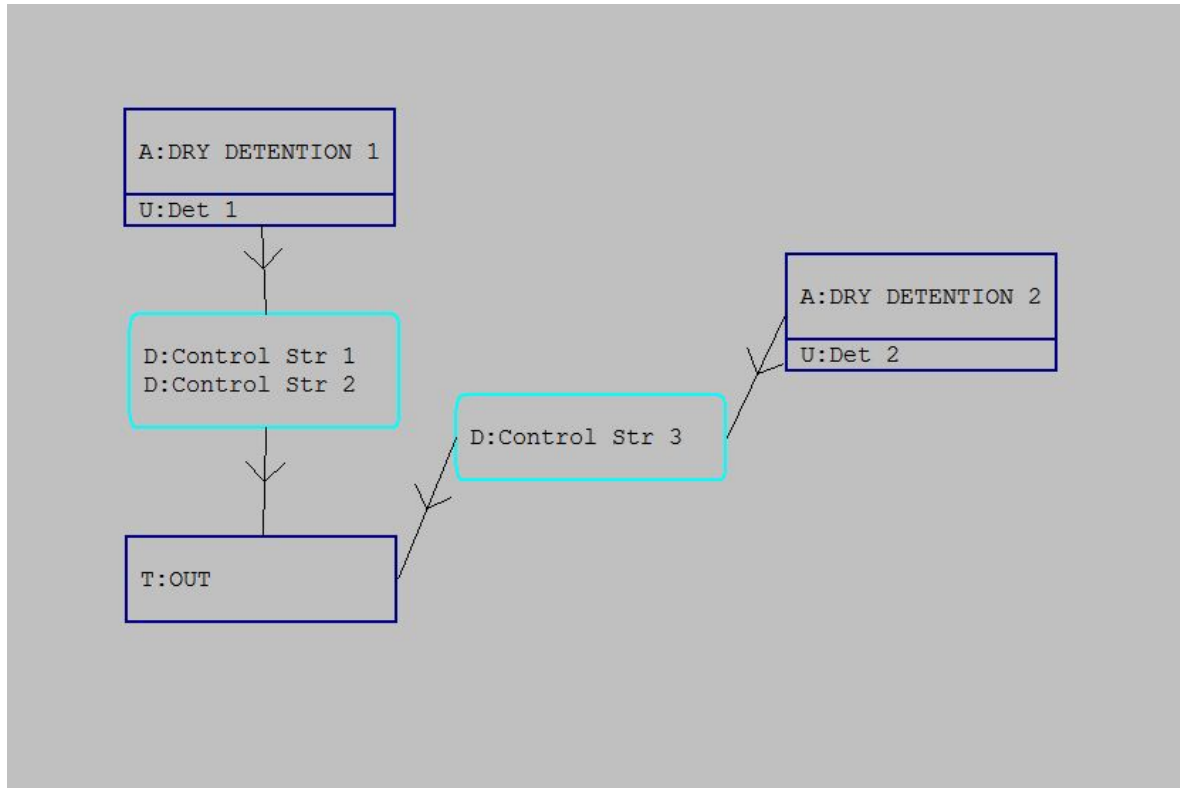
## APPENDIX 1

### Stormwater Calculations Results

From

Advanced Interconnected Channel & Pond Routing  
Streamline Technologies, Inc.

## AdICPR Nodal Diagram



## Input Information Post Development Conditions

=====  
==== Basins =====  
=====

Name: Det 1	Node: DRY DETENTION 1	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File: Sfwmd72	Storm Duration(hrs): 72.00	
Rainfall Amount(in): 10.190	Time of Conc(min): 15.00	
Area(ac): 4.050	Time Shift(hrs): 0.00	
Curve Number: 97.10	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

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Name: Det 2	Node: DRY DETENTION 2	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File: Sfwmd72	Storm Duration(hrs): 72.00	
Rainfall Amount(in): 10.190	Time of Conc(min): 15.00	
Area(ac): 0.540	Time Shift(hrs): 0.00	
Curve Number: 95.00	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

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Name: EXISTING	Node: OUT-EX	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File: Sfwmd72	Storm Duration(hrs): 72.00	
Rainfall Amount(in): 10.190	Time of Conc(min): 15.00	
Area(ac): 5.700	Time Shift(hrs): 0.00	
Curve Number: 84.50	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

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=====  
==== Nodes =====  
=====

Name: DRY DETENTION 1	Base Flow(cfs): 0.000	Init Stage(ft): 93.500
Group: BASE		Warn Stage(ft): 98.500
Type: Stage/Area		

Stage(ft)	Area(ac)
93.500	0.0110
94.000	0.0870
94.500	0.1530
95.000	0.1780
96.000	0.2290
97.000	0.2810
98.000	0.3350
98.500	0.3620

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Name: DRY DETENTION 2	Base Flow(cfs): 0.000	Init Stage(ft): 93.500
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Group: BASE  
Type: Stage/Area

Warn Stage(ft): 96.500

Stage(ft)	Area(ac)
93.500	0.0230
94.000	0.0600
95.000	0.0870
96.000	0.1160
97.000	0.1460

Name: OUT	Base Flow(cfs): 0.000	Init Stage(ft): 91.070
Group: BASE		Warn Stage(ft): 0.000
Type: Time/Stage		

Time(hrs)	Stage(ft)
0.00	91.070
72.00	91.070

Name: OUT-EX	Base Flow(cfs): 0.000	Init Stage(ft): 91.070
Group: BASE		Warn Stage(ft): 0.000
Type: Time/Stage		

Time(hrs)	Stage(ft)
0.00	91.070
72.00	91.070

=====  
==== Drop Structures =====  
=====

Name: Control Str 1	From Node: DRY DETENTION 1	Length(ft): 30.00
Group: BASE	To Node: OUT	Count: 1

UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 12.00	12.00	Flow: Both
Rise(in): 12.00	12.00	Entrance Loss Coef: 0.000
Invert(ft): 92.000	91.700	Exit Loss Coef: 1.000
Manning's N: 0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000	0.000	Solution Incs: 10

Upstream FHWA Inlet Edge Description:  
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:  
Circular Concrete: Square edge w/ headwall

\*\*\* Weir 1 of 2 for Drop Structure Control Str 1 \*\*\*

TABLE

Count: 1	Bottom Clip(in): 0.000
Type: Horizontal	Top Clip(in): 0.000
Flow: Both	Weir Disc Coef: 3.200
Geometry: Rectangular	Orifice Disc Coef: 0.600
Span(in): 49.00	Invert(ft): 97.000
Rise(in): 37.00	Control Elev(ft): 97.000

\*\*\* Weir 2 of 2 for Drop Structure Control Str 1 \*\*\*

TABLE

Count: 1	Bottom Clip(in): 0.000
Type: Vertical: Mavis	Top Clip(in): 0.000
Flow: Both	Weir Disc Coef: 3.200
Geometry: Circular	Orifice Disc Coef: 0.600
Span(in): 3.00	Invert(ft): 93.500
Rise(in): 3.00	Control Elev(ft): 93.500

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Name: Control Str 2	From Node: DRY DETENTION 1	Length(ft): 61.00
Group: BASE	To Node: OUT	Count: 1

UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 12.00	12.00	Flow: Both
Rise(in): 12.00	12.00	Entrance Loss Coef: 0.000
Invert(ft): 90.000	89.400	Exit Loss Coef: 1.000
Manning's N: 0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000	0.000	Solution Incs: 10

Upstream FHWA Inlet Edge Description:  
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:  
Circular Concrete: Square edge w/ headwall

\*\*\* Weir 1 of 2 for Drop Structure Control Str 2 \*\*\*

TABLE

Count: 1	Bottom Clip(in): 0.000
Type: Horizontal	Top Clip(in): 0.000
Flow: Both	Weir Disc Coef: 3.200
Geometry: Rectangular	Orifice Disc Coef: 0.600
Span(in): 49.00	Invert(ft): 97.000
Rise(in): 37.00	Control Elev(ft): 97.000

\*\*\* Weir 2 of 2 for Drop Structure Control Str 2 \*\*\*

TABLE

Count: 1	Bottom Clip(in): 0.000
Type: Vertical: Mavis	Top Clip(in): 0.000
Flow: Both	Weir Disc Coef: 3.200
Geometry: Circular	Orifice Disc Coef: 0.600
Span(in): 3.00	Invert(ft): 93.500
Rise(in): 3.00	Control Elev(ft): 93.500

---

Name: Control Str 3	From Node: DRY DETENTION 2	Length(ft): 150.00
Group: BASE	To Node: OUT	Count: 1

UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 30.00	30.00	Flow: Both
Rise(in): 30.00	30.00	Entrance Loss Coef: 0.000
Invert(ft): 89.000	88.000	Exit Loss Coef: 1.000
Manning's N: 0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000	0.000	Solution Incs: 10

Upstream FHWA Inlet Edge Description:  
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:  
Circular Concrete: Square edge w/ headwall

\*\*\* Weir 1 of 2 for Drop Structure Control Str 3 \*\*\*

TABLE

Count: 1	Bottom Clip(in): 0.000
Type: Horizontal	Top Clip(in): 0.000
Flow: Both	Weir Disc Coef: 3.200
Geometry: Rectangular	Orifice Disc Coef: 0.600
Span(in): 37.00	Invert(ft): 95.500
Rise(in): 24.00	Control Elev(ft): 95.500

\*\*\* Weir 2 of 2 for Drop Structure Control Str 3 \*\*\*

TABLE

Count: 1	Bottom Clip(in): 0.000
Type: Vertical: Mavis	Top Clip(in): 0.000
Flow: Both	Weir Disc Coef: 3.200
Geometry: Circular	Orifice Disc Coef: 0.600
Span(in): 3.00	Invert(ft): 93.500
Rise(in): 3.00	Control Elev(ft): 93.500

=====  
==== Hydrology Simulations =====  
=====

Name: 100yr-72hr  
Filename: F:\15\HII-1500232\D\_DSGN-DATA\D01-00-DESIGN\_DATA\D01-07-Civil\SFWM Stormwater  
Permit\ICPR\100yr-72hr.R32

Override Defaults: Yes  
Storm Duration(hrs): 72.00  
Rainfall File: Sfwmd72  
Rainfall Amount(in): 14.27

Time(hrs)	Print Inc(min)
24.000	60.00
48.000	60.00
72.000	60.00

-----  
Name: 10yr-72hr  
Filename: F:\15\HII-1500232\D\_DSGN-DATA\D01-00-DESIGN\_DATA\D01-07-Civil\SFWM Stormwater  
Permit\ICPR\10yr-72hr.R32

Override Defaults: Yes  
Storm Duration(hrs): 72.00  
Rainfall File: Sfwmd72  
Rainfall Amount(in): 10.19

Time(hrs)	Print Inc(min)
24.000	60.00
48.000	60.00
72.000	60.00

=====  
==== Routing Simulations =====  
=====

Name: 100yr-72hr      Hydrology Sim: 100yr-72hr  
Filename: F:\15\HII-1500232\D\_DSGN-DATA\D01-00-DESIGN\_DATA\D01-07-Civil\SFWM Stormwater  
Permit\ICPR\100yr-72hr.I32

Execute: Yes      Restart: No      Patch: No  
Alternative: No

Max Delta Z(ft): 1.00      Delta Z Factor: 0.00500

Time Step Optimizer: 10.000  
Start Time(hrs): 0.000  
Min Calc Time(sec): 0.5000  
Boundary Stages:

End Time(hrs): 120.00  
Max Calc Time(sec): 60.0000  
Boundary Flows:

Time(hrs)	Print Inc(min)
120.000	60.000
Group	Run
BASE	Yes

-----  
Name: 10yr-72hr                      Hydrology Sim: 10yr-72hr  
Filename: F:\15\HII-1500232\D\_DSGN-DATA\D01-00-DESIGN\_DATA\D01-07-Civil\SFWMD Stormwater  
Permit\ICPR\10yr-72hr.I32

Execute: Yes                      Restart: No                      Patch: No  
Alternative: No

Max Delta Z(ft): 1.00	Delta Z Factor: 0.00500
Time Step Optimizer: 10.000	
Start Time(hrs): 0.000	End Time(hrs): 120.00
Min Calc Time(sec): 0.5000	Max Calc Time(sec): 60.0000
Boundary Stages:	Boundary Flows:

Time(hrs)	Print Inc(min)
120.000	60.000
Group	Run
BASE	Yes

## Input Hydrographs Post Development Conditions

Basin Name: Det 1  
Group Name: BASE  
Simulation: 100yr-72hr  
Node Name: DRY DETENTION 1  
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh256  
Peaking Fator: 256.0  
Spec Time Inc (min): 2.00  
Comp Time Inc (min): 2.00  
Rainfall File: Sfwmd72  
Rainfall Amount (in): 14.270  
Storm Duration (hrs): 72.00  
Status: Onsite  
Time of Conc (min): 15.00  
Time Shift (hrs): 0.00  
Area (ac): 4.050  
Vol of Unit Hyd (in): 1.000  
Curve Number: 97.100  
DCIA (%): 0.000

Time Max (hrs): 60.03  
Flow Max (cfs): 22.33  
Runoff Volume (in): 13.913  
Runoff Volume (ft3): 204541

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Basin Name: Det 2  
Group Name: BASE  
Simulation: 100yr-72hr  
Node Name: DRY DETENTION 2  
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh256  
Peaking Fator: 256.0  
Spec Time Inc (min): 2.00  
Comp Time Inc (min): 2.00  
Rainfall File: Sfwmd72  
Rainfall Amount (in): 14.270  
Storm Duration (hrs): 72.00  
Status: Onsite  
Time of Conc (min): 15.00  
Time Shift (hrs): 0.00  
Area (ac): 0.540  
Vol of Unit Hyd (in): 1.000  
Curve Number: 95.000  
DCIA (%): 0.000

Time Max (hrs): 60.03  
Flow Max (cfs): 2.97  
Runoff Volume (in): 13.653  
Runoff Volume (ft3): 26762

---

Basin Name: EXISTING  
Group Name: BASE  
Simulation: 100yr-72hr  
Node Name: OUT-EX  
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh256  
Peaking Fator: 256.0  
Spec Time Inc (min): 2.00  
Comp Time Inc (min): 2.00

Rainfall File: Sfwmd72  
Rainfall Amount (in): 14.270  
Storm Duration (hrs): 72.00  
Status: Onsite  
Time of Conc (min): 15.00  
Time Shift (hrs): 0.00  
Area (ac): 5.700  
Vol of Unit Hyd (in): 1.000  
Curve Number: 84.500  
DCIA (%): 0.000  
  
Time Max (hrs): 60.07  
Flow Max (cfs): 30.48  
Runoff Volume (in): 12.278  
Runoff Volume (ft3): 254051

---

Basin Name: Det 1  
Group Name: BASE  
Simulation: 10yr-72hr  
Node Name: DRY DETENTION 1  
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh256  
Peaking Fator: 256.0  
Spec Time Inc (min): 2.00  
Comp Time Inc (min): 2.00  
Rainfall File: Sfwmd72  
Rainfall Amount (in): 10.190  
Storm Duration (hrs): 72.00  
Status: Onsite  
Time of Conc (min): 15.00  
Time Shift (hrs): 0.00  
Area (ac): 4.050  
Vol of Unit Hyd (in): 1.000  
Curve Number: 97.100  
DCIA (%): 0.000  
  
Time Max (hrs): 60.03  
Flow Max (cfs): 15.93  
Runoff Volume (in): 9.837  
Runoff Volume (ft3): 144615

---

Basin Name: Det 2  
Group Name: BASE  
Simulation: 10yr-72hr  
Node Name: DRY DETENTION 2  
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh256  
Peaking Fator: 256.0  
Spec Time Inc (min): 2.00  
Comp Time Inc (min): 2.00  
Rainfall File: Sfwmd72  
Rainfall Amount (in): 10.190  
Storm Duration (hrs): 72.00  
Status: Onsite  
Time of Conc (min): 15.00  
Time Shift (hrs): 0.00  
Area (ac): 0.540  
Vol of Unit Hyd (in): 1.000  
Curve Number: 95.000  
DCIA (%): 0.000  
  
Time Max (hrs): 60.03  
Flow Max (cfs): 2.12

Runoff Volume (in): 9.581  
Runoff Volume (ft3): 18781

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Basin Name: EXISTING  
Group Name: BASE  
Simulation: 10yr-72hr  
Node Name: OUT-EX  
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh256  
Peaking Fator: 256.0  
Spec Time Inc (min): 2.00  
Comp Time Inc (min): 2.00  
Rainfall File: Sfwmd72  
Rainfall Amount (in): 10.190  
Storm Duration (hrs): 72.00  
Status: Onsite  
Time of Conc (min): 15.00  
Time Shift (hrs): 0.00  
Area (ac): 5.700  
Vol of Unit Hyd (in): 1.000  
Curve Number: 84.500  
DCIA (%): 0.000

Time Max (hrs): 60.07  
Flow Max (cfs): 21.25  
Runoff Volume (in): 8.275  
Runoff Volume (ft3): 171209

## Output Summary Post Development Conditions

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
DRY DETENTION 1	BASE	100yr-72hr	60.24	97.61	98.50	0.0050	13681	60.00	21.97	60.24	17.91
DRY DETENTION 2	BASE	100yr-72hr	60.19	95.66	96.50	0.0037	4629	60.00	2.92	60.19	2.51
OUT	BASE	100yr-72hr	0.00	91.07	0.00	0.0000	0	60.20	20.41	0.00	0.00
OUT-EX	BASE	100yr-72hr	0.00	91.07	0.00	0.0000	0	60.00	29.95	0.00	0.00
DRY DETENTION 1	BASE	10yr-72hr	60.04	97.29	98.50	0.0050	12931	60.00	15.68	60.04	15.16
DRY DETENTION 2	BASE	10yr-72hr	60.56	95.59	96.50	-0.0032	4534	60.00	2.08	60.56	1.20
OUT	BASE	10yr-72hr	0.00	91.07	0.00	0.0000	0	60.04	15.45	0.00	0.00
OUT-EX	BASE	10yr-72hr	0.00	91.07	0.00	0.0000	0	60.00	20.86	0.00	0.00

## Output Summary Post Development Conditions Detention Pond 1

Simulation	Node	Group	Time	Stage	Warning	Surface	Total	Total	Total	Total
			hrs	ft	Stage	Area	Inflow	Outflow	Vol In	Vol Out
					ft	ft2	cfs	cfs	af	af
10yr-72hrDRY	DETENTION 1	BASE	0.00	93.50	98.50	479	0.00	0.00	0.0	0.0
10yr-72hrDRY	DETENTION 1	BASE	1.02	93.50	98.50	479	0.00	0.00	0.0	0.0
10yr-72hrDRY	DETENTION 1	BASE	2.02	93.54	98.50	765	0.02	0.01	0.0	0.0
10yr-72hrDRY	DETENTION 1	BASE	3.02	93.61	98.50	1189	0.06	0.04	0.0	0.0
10yr-72hrDRY	DETENTION 1	BASE	4.02	93.65	98.50	1476	0.08	0.07	0.0	0.0
10yr-72hrDRY	DETENTION 1	BASE	5.02	93.68	98.50	1656	0.10	0.09	0.0	0.0
10yr-72hrDRY	DETENTION 1	BASE	6.02	93.70	98.50	1783	0.12	0.11	0.0	0.0
10yr-72hrDRY	DETENTION 1	BASE	7.02	93.71	98.50	1879	0.13	0.12	0.0	0.0
10yr-72hrDRY	DETENTION 1	BASE	8.02	93.72	98.50	1956	0.14	0.13	0.0	0.0
10yr-72hrDRY	DETENTION 1	BASE	9.02	93.73	98.50	2022	0.14	0.14	0.1	0.1
10yr-72hrDRY	DETENTION 1	BASE	10.02	93.74	98.50	2080	0.15	0.15	0.1	0.1
10yr-72hrDRY	DETENTION 1	BASE	11.02	93.75	98.50	2137	0.15	0.15	0.1	0.1
10yr-72hrDRY	DETENTION 1	BASE	12.02	93.76	98.50	2179	0.16	0.16	0.1	0.1
10yr-72hrDRY	DETENTION 1	BASE	13.02	93.76	98.50	2205	0.16	0.16	0.1	0.1
10yr-72hrDRY	DETENTION 1	BASE	14.02	93.76	98.50	2225	0.16	0.16	0.1	0.1
10yr-72hrDRY	DETENTION 1	BASE	15.02	93.77	98.50	2242	0.17	0.16	0.1	0.1
10yr-72hrDRY	DETENTION 1	BASE	16.02	93.77	98.50	2256	0.17	0.17	0.2	0.1
10yr-72hrDRY	DETENTION 1	BASE	17.02	93.77	98.50	2268	0.17	0.17	0.2	0.2
10yr-72hrDRY	DETENTION 1	BASE	18.02	93.77	98.50	2279	0.17	0.17	0.2	0.2
10yr-72hrDRY	DETENTION 1	BASE	19.02	93.77	98.50	2288	0.17	0.17	0.2	0.2
10yr-72hrDRY	DETENTION 1	BASE	20.02	93.77	98.50	2296	0.17	0.17	0.2	0.2
10yr-72hrDRY	DETENTION 1	BASE	21.02	93.78	98.50	2303	0.17	0.17	0.2	0.2
10yr-72hrDRY	DETENTION 1	BASE	22.02	93.78	98.50	2310	0.18	0.17	0.2	0.2
10yr-72hrDRY	DETENTION 1	BASE	23.02	93.78	98.50	2315	0.18	0.18	0.3	0.2
10yr-72hrDRY	DETENTION 1	BASE	24.02	93.78	98.50	2321	0.18	0.18	0.3	0.3
10yr-72hrDRY	DETENTION 1	BASE	25.02	93.82	98.50	2581	0.25	0.21	0.3	0.3
10yr-72hrDRY	DETENTION 1	BASE	26.02	93.86	98.50	2891	0.26	0.23	0.3	0.3
10yr-72hrDRY	DETENTION 1	BASE	27.02	93.89	98.50	3063	0.26	0.24	0.3	0.3
10yr-72hrDRY	DETENTION 1	BASE	28.02	93.91	98.50	3164	0.26	0.25	0.3	0.3
10yr-72hrDRY	DETENTION 1	BASE	29.02	93.92	98.50	3227	0.26	0.25	0.4	0.4
10yr-72hrDRY	DETENTION 1	BASE	30.02	93.92	98.50	3270	0.26	0.26	0.4	0.4
10yr-72hrDRY	DETENTION 1	BASE	31.02	93.93	98.50	3300	0.26	0.26	0.4	0.4
10yr-72hrDRY	DETENTION 1	BASE	32.02	93.93	98.50	3321	0.26	0.26	0.4	0.4
10yr-72hrDRY	DETENTION 1	BASE	33.02	93.93	98.50	3338	0.26	0.26	0.5	0.4
10yr-72hrDRY	DETENTION 1	BASE	34.02	93.93	98.50	3351	0.26	0.26	0.5	0.5
10yr-72hrDRY	DETENTION 1	BASE	35.02	93.94	98.50	3362	0.26	0.26	0.5	0.5
10yr-72hrDRY	DETENTION 1	BASE	36.02	93.94	98.50	3370	0.26	0.26	0.5	0.5
10yr-72hrDRY	DETENTION 1	BASE	37.02	93.94	98.50	3386	0.27	0.26	0.5	0.5
10yr-72hrDRY	DETENTION 1	BASE	38.02	93.94	98.50	3405	0.27	0.27	0.6	0.5
10yr-72hrDRY	DETENTION 1	BASE	39.02	93.94	98.50	3419	0.27	0.27	0.6	0.6
10yr-72hrDRY	DETENTION 1	BASE	40.02	93.95	98.50	3429	0.27	0.27	0.6	0.6
10yr-72hrDRY	DETENTION 1	BASE	41.02	93.95	98.50	3437	0.27	0.27	0.6	0.6
10yr-72hrDRY	DETENTION 1	BASE	42.02	93.95	98.50	3444	0.27	0.27	0.7	0.6
10yr-72hrDRY	DETENTION 1	BASE	43.02	93.95	98.50	3449	0.27	0.27	0.7	0.7
10yr-72hrDRY	DETENTION 1	BASE	44.02	93.95	98.50	3454	0.27	0.27	0.7	0.7
10yr-72hrDRY	DETENTION 1	BASE	45.02	93.95	98.50	3458	0.27	0.27	0.7	0.7
10yr-72hrDRY	DETENTION 1	BASE	46.02	93.95	98.50	3461	0.27	0.27	0.7	0.7
10yr-72hrDRY	DETENTION 1	BASE	47.02	93.95	98.50	3464	0.27	0.27	0.8	0.7
10yr-72hrDRY	DETENTION 1	BASE	48.02	93.95	98.50	3467	0.27	0.27	0.8	0.8
10yr-72hrDRY	DETENTION 1	BASE	49.02	93.96	98.50	3556	0.30	0.28	0.8	0.8
10yr-72hrDRY	DETENTION 1	BASE	50.02	93.99	98.50	3706	0.31	0.28	0.8	0.8
10yr-72hrDRY	DETENTION 1	BASE	51.02	94.03	98.50	3949	0.36	0.30	0.9	0.8
10yr-72hrDRY	DETENTION 1	BASE	52.02	94.09	98.50	4287	0.40	0.32	0.9	0.9
10yr-72hrDRY	DETENTION 1	BASE	53.02	94.18	98.50	4825	0.51	0.35	0.9	0.9
10yr-72hrDRY	DETENTION 1	BASE	54.02	94.32	98.50	5616	0.63	0.39	1.0	0.9
10yr-72hrDRY	DETENTION 1	BASE	55.02	94.48	98.50	6562	0.76	0.44	1.0	1.0
10yr-72hrDRY	DETENTION 1	BASE	56.02	94.67	98.50	7037	0.88	0.48	1.1	1.0
10yr-72hrDRY	DETENTION 1	BASE	57.02	94.89	98.50	7519	1.03	0.53	1.2	1.0
10yr-72hrDRY	DETENTION 1	BASE	58.00	95.17	98.50	8122	1.29	0.59	1.3	1.1
10yr-72hrDRY	DETENTION 1	BASE	59.00	95.56	98.50	8995	1.83	0.66	1.4	1.1
10yr-72hrDRY	DETENTION 1	BASE	60.00	97.29	98.50	12921	15.68	14.87	2.1	1.8
10yr-72hrDRY	DETENTION 1	BASE	61.00	97.12	98.50	12516	3.78	4.56	2.9	2.6
10yr-72hrDRY	DETENTION 1	BASE	62.01	97.04	98.50	12346	1.52	1.75	3.2	2.8

10yr-72hrDRY DETENTION 1	BASE	63.01	97.02	98.50	12279	0.97	1.06	3.3	3.0
10yr-72hrDRY DETENTION 1	BASE	64.01	97.01	98.50	12259	0.91	0.93	3.3	3.0
10yr-72hrDRY DETENTION 1	BASE	65.01	96.97	98.50	12164	0.57	0.86	3.4	3.1
10yr-72hrDRY DETENTION 1	BASE	66.01	96.88	98.50	11962	0.55	0.85	3.4	3.2
10yr-72hrDRY DETENTION 1	BASE	67.01	96.79	98.50	11760	0.55	0.84	3.5	3.3
10yr-72hrDRY DETENTION 1	BASE	68.01	96.70	98.50	11563	0.55	0.83	3.5	3.3
10yr-72hrDRY DETENTION 1	BASE	69.01	96.59	98.50	11307	0.38	0.81	3.6	3.4
10yr-72hrDRY DETENTION 1	BASE	70.01	96.45	98.50	10990	0.37	0.79	3.6	3.5
10yr-72hrDRY DETENTION 1	BASE	71.01	96.31	98.50	10675	0.37	0.77	3.6	3.5
10yr-72hrDRY DETENTION 1	BASE	72.01	96.17	98.50	10366	0.00	0.75	3.7	3.6
10yr-72hrDRY DETENTION 1	BASE	73.01	95.91	98.50	9775	0.00	0.71	3.7	3.6
10yr-72hrDRY DETENTION 1	BASE	74.01	95.65	98.50	9190	0.00	0.67	3.7	3.7
10yr-72hrDRY DETENTION 1	BASE	75.01	95.38	98.50	8607	0.00	0.63	3.7	3.8
10yr-72hrDRY DETENTION 1	BASE	76.01	95.12	98.50	8027	0.00	0.58	3.7	3.8
10yr-72hrDRY DETENTION 1	BASE	77.01	94.87	98.50	7462	0.00	0.53	3.7	3.9
10yr-72hrDRY DETENTION 1	BASE	78.01	94.62	98.50	6918	0.00	0.47	3.7	3.9
10yr-72hrDRY DETENTION 1	BASE	79.01	94.37	98.50	5940	0.00	0.41	3.7	3.9
10yr-72hrDRY DETENTION 1	BASE	80.01	94.12	98.50	4460	0.00	0.33	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	81.01	93.84	98.50	2722	0.00	0.22	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	82.01	93.62	98.50	1253	0.00	0.04	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	83.01	93.55	98.50	792	0.00	0.01	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	84.01	93.53	98.50	655	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	85.01	93.52	98.50	600	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	86.01	93.51	98.50	573	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	87.01	93.51	98.50	557	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	88.01	93.51	98.50	547	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	89.01	93.51	98.50	541	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	90.01	93.51	98.50	536	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	91.01	93.51	98.50	533	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	92.01	93.51	98.50	531	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	93.01	93.51	98.50	529	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	94.01	93.51	98.50	528	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	95.01	93.51	98.50	527	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	96.01	93.51	98.50	526	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	97.01	93.51	98.50	525	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	98.01	93.51	98.50	525	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	99.01	93.51	98.50	524	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	100.01	93.51	98.50	524	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	101.01	93.51	98.50	524	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	102.01	93.51	98.50	523	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	103.01	93.51	98.50	523	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	104.01	93.51	98.50	523	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	105.01	93.51	98.50	523	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	106.01	93.51	98.50	522	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	107.01	93.51	98.50	522	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	108.01	93.51	98.50	522	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	109.01	93.51	98.50	522	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	110.01	93.51	98.50	522	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	111.01	93.51	98.50	522	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	112.01	93.51	98.50	522	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	113.01	93.51	98.50	522	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	114.01	93.51	98.50	522	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	115.01	93.51	98.50	522	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	116.01	93.51	98.50	522	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	117.01	93.51	98.50	521	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	118.01	93.51	98.50	521	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	119.01	93.51	98.50	521	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	120.01	93.51	98.50	521	0.00	0.00	3.7	4.0
10yr-72hrDRY DETENTION 1	BASE	120.02	93.51	98.50	521	0.00	0.00	3.7	4.0

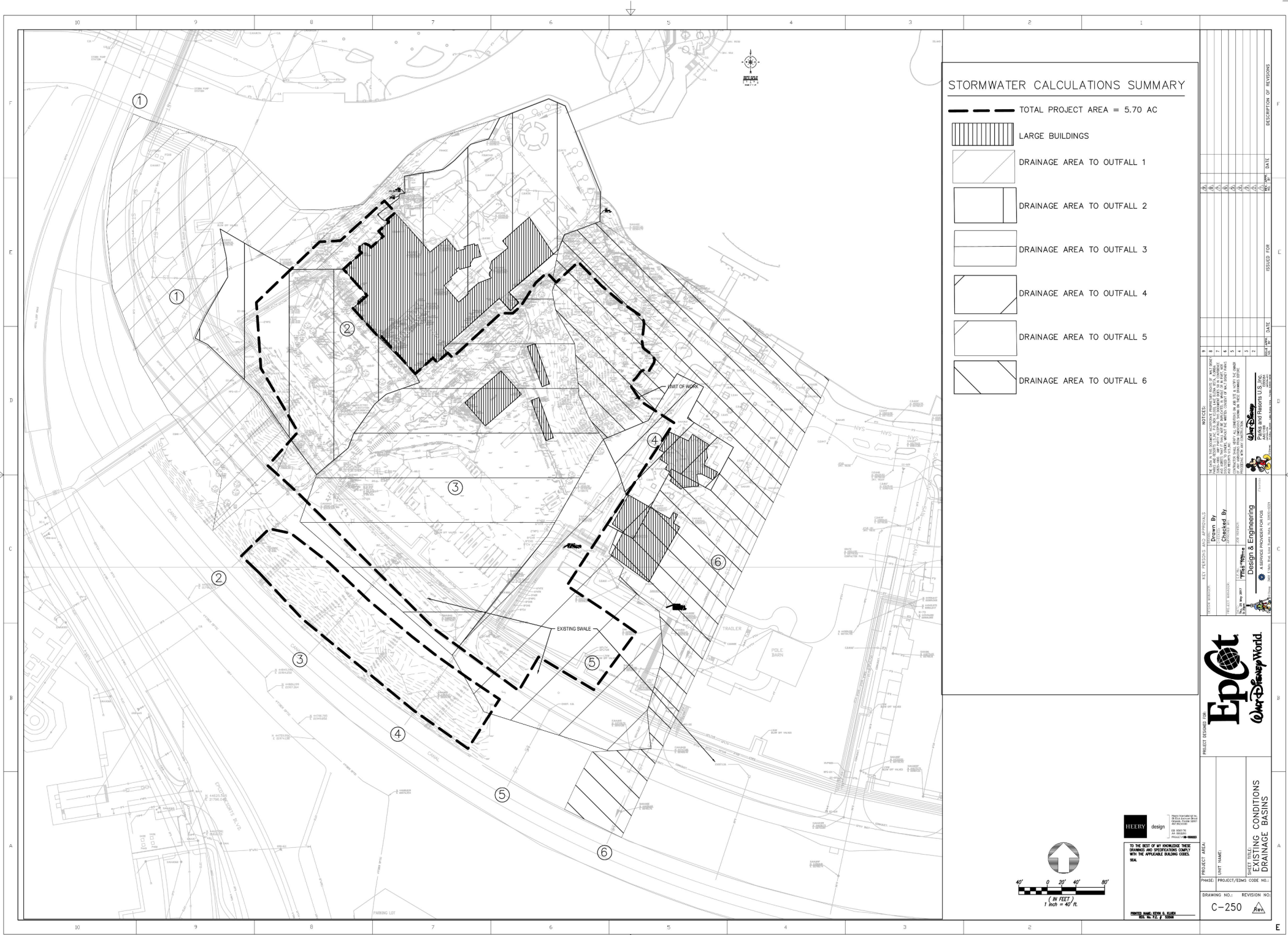
## Output Summary Post Development Conditions Detention Pond 2

Simulation	Node	Group	Time	Stage	Warning Stage	Surface Area	Total Inflow	Total Outflow	Total Vol In	Total Vol Out
			hrs	ft	ft	ft2	cfs	cfs	af	af
10yr-72hrDRY	DETENTION 2	BASE	0.00	93.50	96.50	1002	0.00	0.00	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	1.02	93.50	96.50	1002	0.00	0.00	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	2.02	93.50	96.50	1002	0.00	0.00	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	3.02	93.50	96.50	1010	0.00	0.00	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	4.02	93.51	96.50	1045	0.00	0.00	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	5.02	93.53	96.50	1103	0.01	0.00	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	6.02	93.55	96.50	1164	0.01	0.00	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	7.02	93.57	96.50	1213	0.01	0.01	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	8.02	93.58	96.50	1249	0.01	0.01	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	9.02	93.58	96.50	1276	0.01	0.01	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	10.02	93.59	96.50	1295	0.02	0.01	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	11.02	93.60	96.50	1309	0.02	0.01	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	12.02	93.60	96.50	1321	0.02	0.02	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	13.02	93.60	96.50	1330	0.02	0.02	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	14.02	93.60	96.50	1337	0.02	0.02	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	15.02	93.61	96.50	1344	0.02	0.02	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	16.02	93.61	96.50	1349	0.02	0.02	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	17.02	93.61	96.50	1354	0.02	0.02	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	18.02	93.61	96.50	1358	0.02	0.02	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	19.02	93.61	96.50	1361	0.02	0.02	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	20.02	93.61	96.50	1365	0.02	0.02	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	21.02	93.61	96.50	1367	0.02	0.02	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	22.02	93.61	96.50	1370	0.02	0.02	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	23.02	93.61	96.50	1372	0.02	0.02	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	24.02	93.62	96.50	1374	0.02	0.02	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	25.02	93.63	96.50	1407	0.03	0.03	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	26.02	93.64	96.50	1442	0.03	0.03	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	27.02	93.64	96.50	1458	0.03	0.03	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	28.02	93.64	96.50	1465	0.03	0.03	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	29.02	93.64	96.50	1469	0.03	0.03	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	30.02	93.65	96.50	1471	0.03	0.03	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	31.02	93.65	96.50	1473	0.03	0.03	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	32.02	93.65	96.50	1475	0.03	0.03	0.0	0.0
10yr-72hrDRY	DETENTION 2	BASE	33.02	93.65	96.50	1476	0.03	0.03	0.1	0.0
10yr-72hrDRY	DETENTION 2	BASE	34.02	93.65	96.50	1478	0.03	0.03	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	35.02	93.65	96.50	1479	0.03	0.03	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	36.02	93.65	96.50	1480	0.03	0.03	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	37.02	93.65	96.50	1482	0.03	0.03	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	38.02	93.65	96.50	1484	0.03	0.03	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	39.02	93.65	96.50	1485	0.03	0.03	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	40.02	93.65	96.50	1486	0.03	0.03	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	41.02	93.65	96.50	1486	0.03	0.03	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	42.02	93.65	96.50	1487	0.04	0.03	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	43.02	93.65	96.50	1488	0.04	0.04	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	44.02	93.65	96.50	1488	0.04	0.04	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	45.02	93.65	96.50	1489	0.04	0.04	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	46.02	93.65	96.50	1489	0.04	0.04	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	47.02	93.65	96.50	1489	0.04	0.04	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	48.02	93.65	96.50	1490	0.04	0.04	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	49.02	93.65	96.50	1501	0.04	0.04	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	50.02	93.66	96.50	1516	0.04	0.04	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	51.02	93.67	96.50	1543	0.05	0.04	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	52.02	93.68	96.50	1579	0.05	0.05	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	53.02	93.70	96.50	1642	0.07	0.06	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	54.02	93.73	96.50	1735	0.08	0.07	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	55.02	93.76	96.50	1850	0.10	0.08	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	56.02	93.80	96.50	1962	0.12	0.10	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	57.02	93.84	96.50	2091	0.14	0.11	0.1	0.1
10yr-72hrDRY	DETENTION 2	BASE	58.00	93.90	96.50	2288	0.17	0.12	0.2	0.1
10yr-72hrDRY	DETENTION 2	BASE	59.00	94.00	96.50	2619	0.24	0.15	0.2	0.2
10yr-72hrDRY	DETENTION 2	BASE	60.00	95.07	96.50	3874	2.08	0.28	0.3	0.2
10yr-72hrDRY	DETENTION 2	BASE	61.00	95.55	96.50	4481	0.50	0.66	0.4	0.2
10yr-72hrDRY	DETENTION 2	BASE	62.01	95.49	96.50	4407	0.20	0.32	0.4	0.3

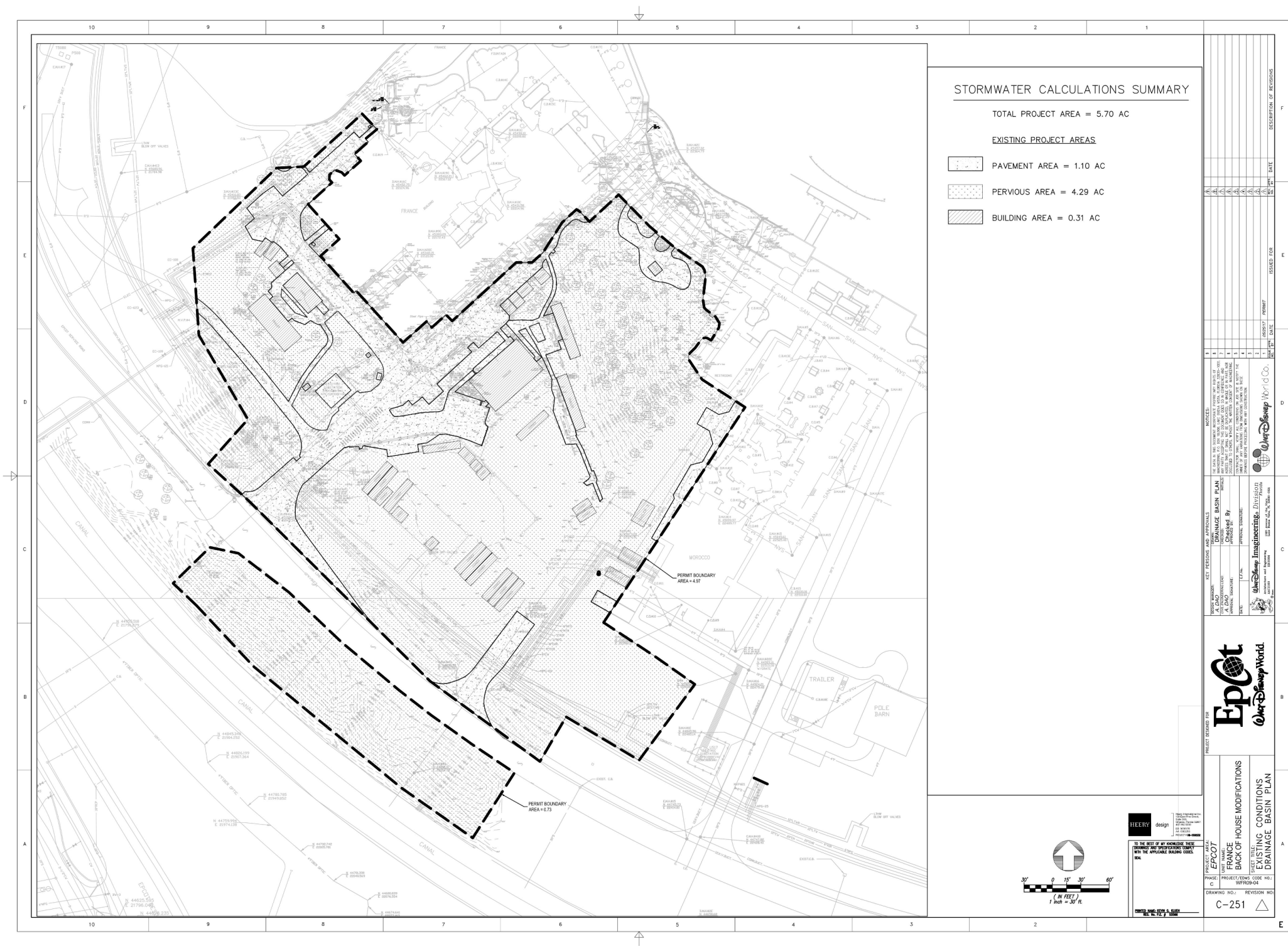
10yr-72hrDRY	DETENTION	2	BASE	63.01	95.36	96.50	4247	0.13	0.31	0.4	0.3
10yr-72hrDRY	DETENTION	2	BASE	64.01	95.21	96.50	4051	0.12	0.30	0.4	0.3
10yr-72hrDRY	DETENTION	2	BASE	65.01	95.03	96.50	3831	0.08	0.28	0.4	0.3
10yr-72hrDRY	DETENTION	2	BASE	66.01	94.84	96.50	3605	0.07	0.26	0.4	0.4
10yr-72hrDRY	DETENTION	2	BASE	67.01	94.66	96.50	3391	0.07	0.24	0.5	0.4
10yr-72hrDRY	DETENTION	2	BASE	68.01	94.49	96.50	3189	0.07	0.22	0.5	0.4
10yr-72hrDRY	DETENTION	2	BASE	69.01	94.32	96.50	2988	0.05	0.20	0.5	0.4
10yr-72hrDRY	DETENTION	2	BASE	70.01	94.15	96.50	2790	0.05	0.17	0.5	0.4
10yr-72hrDRY	DETENTION	2	BASE	71.01	94.00	96.50	2619	0.05	0.15	0.5	0.4
10yr-72hrDRY	DETENTION	2	BASE	72.01	93.88	96.50	2225	0.00	0.12	0.5	0.4
10yr-72hrDRY	DETENTION	2	BASE	73.01	93.71	96.50	1684	0.00	0.06	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	74.01	93.62	96.50	1387	0.00	0.02	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	75.01	93.58	96.50	1252	0.00	0.01	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	76.01	93.56	96.50	1182	0.00	0.01	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	77.01	93.54	96.50	1142	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	78.01	93.54	96.50	1116	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	79.01	93.53	96.50	1098	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	80.01	93.53	96.50	1085	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	81.01	93.52	96.50	1075	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	82.01	93.52	96.50	1068	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	83.01	93.52	96.50	1062	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	84.01	93.52	96.50	1057	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	85.01	93.52	96.50	1053	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	86.01	93.51	96.50	1050	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	87.01	93.51	96.50	1047	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	88.01	93.51	96.50	1045	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	89.01	93.51	96.50	1042	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	90.01	93.51	96.50	1041	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	91.01	93.51	96.50	1039	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	92.01	93.51	96.50	1038	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	93.01	93.51	96.50	1036	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	94.01	93.51	96.50	1035	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	95.01	93.51	96.50	1034	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	96.01	93.51	96.50	1033	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	97.01	93.51	96.50	1033	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	98.01	93.51	96.50	1032	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	99.01	93.51	96.50	1031	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	100.01	93.51	96.50	1031	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	101.01	93.51	96.50	1030	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	102.01	93.51	96.50	1030	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	103.01	93.51	96.50	1029	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	104.01	93.51	96.50	1029	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	105.01	93.51	96.50	1029	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	106.01	93.51	96.50	1028	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	107.01	93.51	96.50	1028	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	108.01	93.51	96.50	1028	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	109.01	93.51	96.50	1027	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	110.01	93.51	96.50	1027	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	111.01	93.51	96.50	1027	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	112.01	93.51	96.50	1027	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	113.01	93.51	96.50	1026	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	114.01	93.51	96.50	1026	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	115.01	93.51	96.50	1026	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	116.01	93.51	96.50	1026	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	117.01	93.51	96.50	1026	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	118.01	93.51	96.50	1026	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	119.01	93.51	96.50	1025	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	120.01	93.51	96.50	1025	0.00	0.00	0.5	0.5
10yr-72hrDRY	DETENTION	2	BASE	120.02	93.51	96.50	1025	0.00	0.00	0.5	0.5

## APPENDIX 2

### Existing and Post-Development Drainage Basin Maps



Existing Conditions Drainage Basin Plan 1



Existing Conditions Drainage Basin Plan 2





## APPENDIX 3

### Geotechnical Report

June 5, 2017

**Walt Disney Imagineering**  
P.O. Box 10321  
Lake Buena Vista, Florida 32830

Attention: Mr. Armand Dao, P.E.  
Senior Civil Engineer

RE: Summary of Findings  
Stormwater Management Upgrades  
France BOH Improvements  
Epcot Center Theme Park  
Walt Disney World, Florida  
PSI Project No. 07571738

Dear Mr. Dao:

This letter transmits the results of an auger boring drilled at the noted site earlier this year. The boring and accompanying tests are to be used in designing a dry bottom retention pond for the noted project. Also presented herein are geotechnical parameters for use in a pond recovery analyses.

On April 17, 2017, we drilled/sampled a 15 foot deep auger boring at the site. The boring was drilled at the approximate location shown on **Sheet 1**. From near the boring, an undisturbed tube sample was recovered for laboratory permeability testing. The sample was tested in our laboratory using a falling head permeameter with results as follows.

Coefficient of Vertical Permeability	5 feet/day
Percent Fines	5 percent by dry weight passing the U.S. Standard No. 200 sieve

Samples recovered from the auger boring were returned to our Orlando laboratory for visual stratification and select testing. The subsoils recovered from the boring were visually stratified in general accordance with the guidelines of the Unified Soil Classification System (USCS). A record of the material encountered in the boring is provided as a boring log on **Sheet 2**.

A sample was tested to determine the natural moisture content and percent fines passing the U.S. Standard No. 200 sieve. These tests were carried out following appropriate ASTM procedures. The results of the laboratory tests (including that of the falling head permeameter) are included on the boring log adjacent to the depth increment of the test specimen.

A review of the auger boring indicates subsoils to comprise a varying sequence of fine sands in the depth interval drilled (15 feet). These sands grade clean to slightly silty in composition (i.e. SP and SP/SM materials) and they include fill that was placed during the construction of Epcot as well as native mineral soils.

Groundwater was observed in the boring at a depth of 6 feet below grade at the time of drilling. We estimate that this corresponds to an elevation slightly above that of the water level in the perimeter canal to the south. The water level at the time of drilling was estimated at approximate elevation +89 feet.

Water levels will fluctuate seasonally in response to rainfall or lack thereof. The water level in the soil will be at or slightly above that of the water level in the perimeter canal year round. We understand that the 100 year flood level in the perimeter canal is elevation +92.34 feet (NGVD 29 Disney).

For design of the proposed retention pond, we recommend the following parameters to represent the effective aquifer.

Base of Effective Aquifer	+88 feet
Groundwater Table Elevation	+92.5 feet
Horizontal Permeability of Effective Aquifer	8 feet/day
Soil Porosity	25 percent

The pond should be designed in accordance with an approved program such as Ponds or Modret. Additionally, the pond should be designed/constructed in accordance with Water Management District criteria. Based on the proximity of the new pond to the perimeter canal, it will to some degree be controlled by the water level in the perimeter canal. In order to enhance pond performance, we suggest that you consider a bleeder or underdrain system plus have the pond bottom subtly slope toward the bleeders/perimeter canal to maintain a dry condition even if the calculations suggest that the ponds will recover to a dry condition.



We appreciate the opportunity to be of service on this project and we trust that the foregoing and accompanying attachments are of assistance to you at this time. If you have any questions regarding the contents of this report, or if we may be of further service, please contact the undersigned.

Sincerely,  
**PROFESSIONAL SERVICE INDUSTRIES, INC.**  
**Certificate of Authorization No. 3684**



Ian Kinnear, P.E.  
Chief Geotechnical Engineer  
Florida License No. 32614

07571738 (France BOH – Stormwater Upgrades).doc

Attachments

- Sheets 1 and 2





# **LOCATION PLAN**

SCALE: 1"=100'

## **LEGEND**

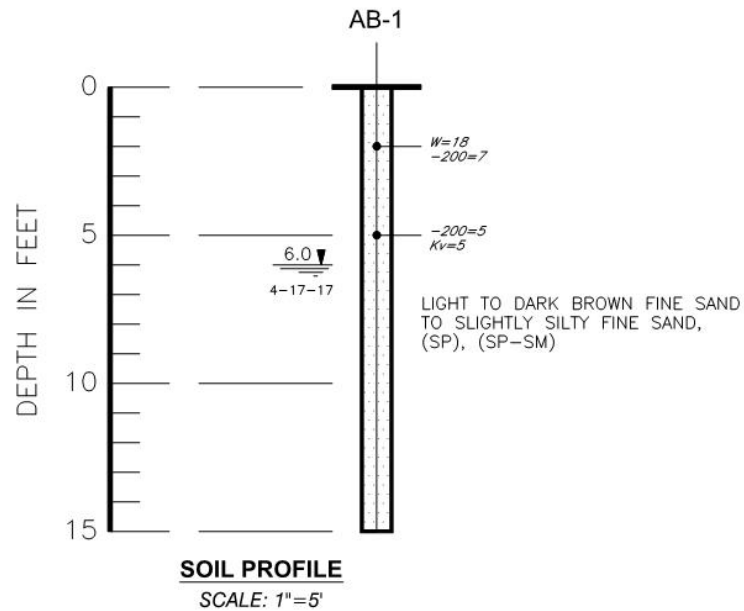


APPROXIMATE LOCATION OF  
AUGER BORING

GEOTECHNICAL ENGINEERING SERVICES  
**FRANCE BOH IMPROVEMENTS**  
**EPCOT CENTER THEME PARK**  
WALT DISNEY WORLD, FLORIDA

**psi** *Information  
To Build On*  
Engineering • Consulting • Testing

DRAWN:	DJW	SCALE:	NOTED	PROJ. NO:	07571738
CHKD:	IK	DATE:	4-19-17	SHEET:	1



#### LEGEND

- (SP) UNIFIED SOIL CLASSIFICATION GROUP SYMBOL
- 6.0 ▼ DEPTH TO GROUNDWATER LEVEL IN FEET WITH  
4-17-17 DATE OF READING
- W NATURAL MOISTURE CONTENT IN PERCENT
- 200 FINES PASSING #200 SIEVE IN PERCENT
- Kv COEFFICIENT OF VERTICAL PERMEABILITY  
IN FEET PER DAY

GEOTECHNICAL ENGINEERING SERVICES  
**FRANCE BOH IMPROVEMENTS**  
**EPCOT CENTER THEME PARK**  
WALT DISNEY WORLD, FLORIDA

**[psi]** *Information*  
*To Build On*  
Engineering • Consulting • Testing

DRAWN: DJW	SCALE: NOTED	PROJ. NO: 07571738
CHKD: IK	DATE: 4-19-17	SHEET: 2